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EMBRYONIC DEVELOPMENT IN UNFERTILIZED TURKEY EGGS

Discovery in 1952 of embryonic development in unfertilized turkey eggs by poultry scientists at USDA's Agricultural Research Center, Beltsville, Maryland, has led to careful rechecking of the phenomenon in efforts to determine the causes and whether the trait to produce such eggs is inherited.

The fact that parthenogenesis does exist was convincingly demonstrated in tests conducted a year ago at Beltsville by one of the discoverers, Dr. M. W. Olsen. In this test, 79 Beltsville Small White female turkeys were segregated from their immature male pen mates before they were six weeks old and kept in pens remote from other turkeys. These hens produced 2,537 eggs during the eight weeks of the experiment. The eggs were carefully marked as they were gathered and placed in an incubator by Dr. Olsen, who kept the experiment--for which he was solely responsible--under lock and key. These eggs were candled first on the ninth day of incubation because previous experience had shown that development of parthenogenic embryos requires three or four days more of incubation than is the case with normal, fertilized eggs.

Out of the lot of 2,537 eggs, Dr. Olsen found 568 (22.4 percent) that showed parthenogenic development. Embryos and blood vessels were found in 27 eggs, and 3 reached a stage of development equivalent to that achieved after 26 to 27 days in normal eggs. Embryos that developed to or beyond the equivalent of a normal 9-day embryo appeared, with one exception, to be perfectly formed. In the remaining eggs, parthenogenic development was limited to extra-embryonic membranes in 492 cases and to discernible blood vessels in 49 cases.

Incidence of parthenogenesis in the 1954 tests amounted to 22.4 percent as compared with 16.7 percent in 1952, when the phenomenon was discovered, and 14.1 percent in a test run in 1953. Scientists believe that the higher incidence in the 1954 tests was the result of using eggs from Beltsville Small White turkey females that had a strongly developed trait for producing such eggs.

Out of the 1954 test came two findings; (1) proof that parthenogenesis does exist, and (2) some evidence that it is an inherited trait.

Dr. Olsen has been conducting another test, also under "security" conditions, in a further attempt to determine whether the trait is inherited. This 90-day test was completed May 1. Results have confirmed actual findings of previous tests so far as existence of the phenomenon is concerned.

This research work has developed one practicable result of interest to turkey producers. Parthenogenic embryos do not develop much before the fourth day of incubation and some take considerably longer. This means that hatcherymen can safely discard all eggs that do not show embryonic development by the fourth day of incubation. Normal eggs develop embryos, usually within 18 to 24 hours, that are discernible by candling.



